

Refereed paper submission for the  
SEAANZ Conference  
Brisbane

September 26-29, 2004

**Small Firms and E-Business Uptake:  
Embracing an Incremental Learning Approach**

Dr Patrice Braun  
Jessie Harman  
Centre for Regional Innovation & Competitiveness  
University of Ballarat  
P.O.Box 663  
Ballarat, Vic 3353  
(03) 5327-9465/5327-9640  
[p.braun@ballarat.edu.au](mailto:p.braun@ballarat.edu.au)  
[j.harman@ballarat.edu.au](mailto:j.harman@ballarat.edu.au)

**Abstract**

To date, most research into the implications of the Internet for small and medium size enterprises (SMEs) has focused on individual business barriers to information and communication technologies (ICT) and e-business adoption. Such research has shown that SMEs tend to be time and resource-poor, with their size being their main disadvantage vis-à-vis ICT adoption. Government intervention designed to overcome such barriers and facilitate adoption of ICT has not markedly increased the uptake of e-business by SMEs. In this discussion paper, the authors posit that the current approach to ICT adoption interventions fail to take into account the incremental nature of the SMEs e-business learning processes. An incremental learning model adapted from Earl (2000) is presented that positions ICT adoption as an evolutionary process and stresses the need for continuous learning and change. To help small business owners articulate, value and meet their evolving e-business needs, the authors suggest that ICT adoption strategies should focus on facilitating not only the acquisition of skills and knowledge, but also the development of e-business networks which underpin the SME ICT adoption process.

**Introduction**

In line with global trends, the influence of the Internet has spread considerably throughout the Australian business world. The ratio of businesses with a web presence has been growing rapidly, rising from a mere six percent in 1997-98 to 22 percent in 2001 (ABS, 2002).

Analysts project that there will be parallel rates of growth in business to consumer (B2C) and business to business (B2) e-commerce conducted via the Internet and that such growth will have a significant impact on Australia's national and regional economies (NOIE, 2002).

At the same time, however, there is clear evidence that the rates of adoption of B2C and B2B e-commerce differ between big business and SME sectors in Australia (ABS, 2002). Despite anticipated growth in on-line activity, e-commerce uptake by Australian SMEs has remained relatively slow. Recent reports suggest that electronic mail (email) remains the single most important reason for SMEs using the Internet (Sensis, 2003; Van Beveren, 2002).

This discussion paper examines e-commerce adoption by Australian SMEs. In light of our existing knowledge regarding the barriers to adoption of e-commerce by SMEs, we seek to address the following questions: What is the nature of the e-commerce adoption process in these firms? How can SME firms be assisted more effectively to adopt e-commerce at rates similar to their big business counterparts? The paper begins with a review of ICT and e-commerce adoption and their impacts on Australian business generally. It continues with a description of our findings of research conducted over time into e-commerce adoption by SMEs in Western Victoria. Based on our experience we posit that the e-commerce adoption process for SMEs is best represented as a *continuum* that recognises the incremental nature of the ICT/e-commerce learning process for SME owners. The paper concludes by outlining an incremental learning model and examining the implications of this approach for public policy, specifically as it relates to improving e-commerce adoption rates for Australian SMEs.

## **ICT and E-commerce**

In Australia, as in other parts of the developed world, the influence of the Internet on business has spread considerably. The ratio of businesses with a web presence has been growing swiftly, rising from a mere six percent in 1997-98 to 22 percent in 2001 (ABS, 2002). For example, on 30 June 2001 virtually every large Australian business (those employing 100 or more persons) used computers (100%) or had access to the Internet (99%), while 81% had a Web presence. There was a noticeable rise in expenditure by small and medium size enterprises (SMEs) on both computer hardware and software during 2002 and the rate of Internet connectivity among SMEs has continued to grow during 2003 from 79 per cent to 81 percent (Sensis, 2003).

While still in its infancy, e-commerce developments have also taken off on a global scale. Business-to-Consumer (B2C) e-commerce conducted via the Internet is projected to have a significant impact on Australia's national and regional economies (NOIE, 2002). States and regions that have industry sectors offering products and services rather than commodity export activities are especially expected to enjoy efficiency gains. Even more so than B2C, Business-to-Business (B2B) e-commerce has considerable economic potential, especially in terms of greater profitability due to decreased production costs and increased product supply efficiencies (The Allen Consulting Group, 2002). Growth is expected to come predominantly from B2B activities with larger companies extending e-business operations, government scaling-up e-procurement activity and increased e-business participation by SMEs (NOIE,

2000). Industry sectors that are most likely to expand into the B2C and B2B e-commerce arena include information technology, tourism, entertainment, banking and finance.

Web-based business can clearly be an extremely attractive option for firms. By building a platform for sustained efficiency gains, the net benefits of e-commerce for any industry and business have the potential to be considerable. One might think that the rapid development of information and communication technologies (ICT) and the Internet as a communication, marketing and transaction channel would appeal to SMEs, but to date Australian SMEs have displayed reticence towards adoption of networked technologies. In contrast to large companies, SMEs and micro businesses (those employing fewer than 5 persons) had a notably lower level of ICT adoption; 79% used computers, 64% had access to the Internet and only 14% had a Web presence (ABS, 2002). Despite the anticipated growth in online activity, e-commerce uptake amongst SMEs has remained relatively slow, with email remaining the single most important reason for SMEs for using the Internet to communicate with clients, customers and suppliers (Sensis, 2003; Van Beveren & Thompson, 2002).

Adoption of e-commerce -- referred to here in terms of connection, electronic data exchange and transaction capability via the Internet -- and networked technologies by SMEs is directly related to the size and nature of SMEs and largely depends on their perception of affordability and opportunity for their business (OECD, 1998). Although over sixty percent of Australian SMEs -- many of which are regionally based -- now have Internet connectivity (The Allen Consulting Group, 2001), there are still substantial issues related to the uptake of e-commerce by Australian SMEs. Australian SMEs not only hesitate to invest their precious time and money in a rapidly changing e-commerce economy, the relatively higher cost of access to rural telecommunications networks, unreliable service and lack of bandwidth in regional and rural areas have also proven to be significant ICT and e-commerce uptake barriers (Opticon Australia, 2001). Studies further cite lack of resources to manage web-related tasks and lack of relevant skills as the main e-commerce uptake deterrents for SMEs (Skillsnet Association Cooperative, 2001; Van Beveren & Thompson, 2002; Walczuch, Van Braven, & Lundgren, 2000).

Our own empirical research in Western Victoria supports claims in the literature that the purported benefits of ICT and e-business have not been fully realised, e.g., our findings reiterate that Victorian SMEs have yet to move beyond email (Braun, 2003a; Harman & Lowe, 2002). In addition, our research findings, as illustrated below, also suggest that government intervention designed to overcome ICT adoption barriers and facilitate adoption of ICT has not markedly increased the uptake of e-business by SMEs.

In a case study analysis of SMEs in western Victoria using (six federal and state funded) Community Enterprise Centres (CECs) for their ICT needs, SME attitudes towards the Internet and e-commerce proved predominantly reactive, revolving around responding to 'outside' pressure -- from their industry, from competitors and from buyers. Loss of services in the immediate vicinity (e.g., banks, government departments) was also identified as a motivating factor to use (a CEC and its) ICT services. Only a small number of firms cited business process integration and efficiency improvements as factors driving the adoption of ICT. Most SMEs surveyed

as part of the case study found it significantly more difficult to articulate their e-commerce and online transaction needs for the longer-term. The majority of businesses identified further training and development of e-commerce related skills and knowledge as a priority, emphasising the need for simple to understand training tailored to meet the needs of individual SMEs. The majority of businesses in the case study were uncertain about what to expect from their CEC in the first instance, approaching their CEC centre with an attitude of 'let's see what the centre can do for me' in terms of value proposition (Harman & Lowe, 2002).

Empirical evidence from a (federally funded) portal development study on the uptake of e-commerce by an SME network similarly suggests that SMEs have yet to see the value adding of integrating ICT into their business, lacking the strategic e-business planning processes, formal and informal skills and knowledge required to move forward (Braun, 2003a). The latter study also found that the Australian SME culture tended to be atomistic and competitive-exclusive rather than collaborative in nature (Braun, 2002). This is noteworthy in that federally funded partnership programs such as the Information Technology Online (ITOL) program, intended to foster SME collaboration for e-business uptake purposes (NOIE, 1999), typically appear to overlook SME skilling and culture issues. As a recent analysis of the ITOL program revealed -- the majority of funded portal projects ceased to exist once funding dried up (More, 2003 #501).

From our empirical work it may be summarised that major impediments to adopting ICT and e-commerce for SMEs relate to both SME culture as well as to lack of skills and resources. While a great deal of effort has gone into designing glamorous websites and portals, much less effort has gone into supporting these so-called soft adoption needs, especially in terms of confidence in and strategic competence to take the necessary steps towards integrating ICT and e-commerce into their business practices. It was outside the scope of our research to establish whether SMEs may now be falling behind in the economic race to create competitive advantage in the information economy. We are, however, inclined to suggest that SMEs that continue to remain unskilled and unintegrated in the information economy may eventually experience a reduction of market opportunities.

### **Incremental Learning**

We have known for some time that e-commerce novices need substantial encouragement and support to make them willing to take the e-business plunge, but as indicated above it is especially the soft innovation issues, such as awareness, capacity and resource building they need help with (Simpson, 2002). For many SME proprietors ICT is a language they still do not understand and e-commerce a product for which they have no use. SMEs hence need substantial encouragement to move into, get comfortable and take mental, physical and virtual possession of the ICT domain.

ICT encompasses a series of separate yet interrelated components; for example, email, the Internet, the web, and e-commerce, which can be adopted in a variety of social and business settings. It has been suggested that ICT cannot be considered as a single technological innovation, but rather as a series of (process) innovations (Walczuch et al., 2000). Rogers (1995) introduces the concept of "technology clusters", one or more

interrelated elements of technology that are adopted in context, with one innovation influencing an individual's perception of the next innovation; his later work on the diffusion of new technologies does not identify ICT as a set of multiple innovations (Rogers, 1997). It has further been suggested that complex ICT solutions should be understood as socially constructed and learning intensive artefacts, which can be adopted for varying reasons within volatile diffusion arenas (Lyytinen & Damsgaard, 2001).

Our own research confirms that embracing ICT tools and e-business related technologies is a complex and phase-based process. While email had indeed become the standard communication for most SMEs, many have not yet progressed to the e-commerce phase, suggesting that adopting e-business technologies is an evolutionary process that requires the negotiation of a journey that involves continuous learning and change. It will be some time before Australian SMEs are ready to drop the 'e' out of e-business and implement e-business models as part of their daily business routines. Adoption of the entire cluster of ICT technologies may hence be conceptualised as a linear process along an adoption continuum (Figure 1).

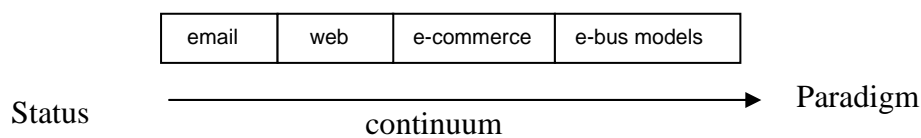


Figure 1  
ICT adoption continuum

After adopting email, the web is the second step for adoption consideration, e-commerce the third step, potentially followed by adoption of a complete e-business model at which point we may speak of or an ICT paradigm shift.

Rogers (1995) recognises the evolutionary process in terms of attitudinal change and time required for innovation-decision and adoption processes, but omits codified and tacit skills, prior experience and learning as part of that process. Earl (2000) similarly acknowledges that becoming an e-business is an evolutionary process, but Earl's model stresses the need for continuous learning and change to help identify evolving e-business issues such as the integration of new technologies and online value creation entailing. There are six phases in Earl's model: (1) an external and (2) internal communications phase; (3) an e-commerce strategy phase; (4) an e-business processes phase; (5) an e-enterprise operational phase; and, finally, (6) the adoption of a dynamic e-business model or transformation phase. Once the e-business transformation steps are completed and the business has successfully negotiated the journey of becoming an e-business, e-business has become the norm and the 'e' can be dropped out of e-business. See Earl (2000) for an in-depth discussion of the model.

The latter framework applies to large companies, but we suggest that this framework would be useful to consider in terms of incremental learning processes for e-business adoption by small firms. In incorporating the various e-business adoption needs from

the aforementioned studies, the six suggested learning phases that would be relevant to SMEs include:

- (1) external communications phase - SME connectivity & basic website development
- (2) internal communications phases – SME information and communication capacity building;
- (3) e-commerce strategy phase (B2C and B2B awareness and developing strategies to accommodate 24/7 business operations);
- (4) e-business processes phase - synchronising business processes to match customers' expectations in the new economy;
- (5) e-enterprise operational phase – value adding through marketing, customer service, transaction, supply chain, delivery, etc;
- (6) adoption of a dynamic e-business model or transformation phase – dropping the 'e' out of e-business and remaining flexible and open to change.

While ICT/e-business adoption levels will vary from firm to firm, as identified in our regional case study (Harman & Lowe, 2002), in the main learning issues revolve around facilitating 'entry-level' or low-level e-commerce involvement first, followed by longer-term strategic planning and integration into overall business activities (Braun, 2003b).

### **Potential Implications and Conclusion**

In courting SMEs to participate in new communication and distribution channels such as the web, there continues to be a need to assist and support small business in regional areas to adopt ICT and e-business tools. Therefore, it would appear that there is still a role for appropriately tailored and targeted SME education and training programs and enterprise centres such as the Victorian CECs in assisting small business owners/operators to embrace new technologies. However, public policy needs to recognise that the SME learning cycle is an evolutionary and ongoing one, which does not correspond neatly with the political funding cycle.

But simply adopting the suggested six-step learning program is not enough. It is equally important for ICT initiative and program designers to consider the potential of these programs to go beyond either education and training or network building. In an environment of disconnected networks, there is a combined need to help small business owners articulate, value and meet their evolving e-business needs as well as to help create and facilitate the building of SME networks that underpin the ICT adoption process.

By offering ongoing individual and collective learning support and by linking SMEs to appropriate (regional, industry, institutional learning, etc) support networks, learning programs would be in a better position to contribute towards a culture change and help SMEs to move away from a systemically embedded culture of competition and autonomy towards a better understanding of the potential power of B2C and B2B supply-chains, value chains and flow-ons in their local or regional areas.

## References

- Australian Bureau of Statistics (ABS) (2002). *Business Use of Information Technology, Australia - ABS report 8129.0*. Retrieved June 26, 2002, from <http://www.abs.gov.au/ausstats/abs>
- Braun, P. (2002). Networking Tourism SMEs: E-Commerce and E-marketing Issues in Regional Australia. *Information Technology & Tourism*, 5(1), 13-24.
- Braun, P. (2003a). E-Commerce in the Networked Economy: The Case of Australian Tourism Firms. *The E-Business Review*, 3, 11-14.
- Braun, P. (2003b). Virtual SME networks: Pathways towards Online Collaboration. *Journal of New Business Ideas and Trends*, 1(2), 1-10.
- Earl, J. M. (2000). Evolving the E-Business. *Business Strategy Review*, 11(2), 33-38.
- Harman, J., & Lowe, J. (2002). *Community Enterprise Centres in Western Victoria - Evaluation Report Six - Operational Assessment*. Ballarat: Centre for Regional Innovation & Competitiveness.
- Lyytinen, K., & Damsgaard, J. (2001). *What's wrong with the Diffusion of Innovation Theory. The case of a complex and networked technology*. Paper presented at the IFIP 8.6. Conference, Banff, Canada.
- More, E., & McGrath, G. M. (2003). Organizational Collaboration in An E-Commerce Context: Australia's ITOL Project. *The E-Business Review*, 3, 121-124.
- NOIE. (1999). *Information Technology Online (ITOL) Grant Program*. Retrieved 1 August, 2002, from <http://www.noie.gov.au/Projects/ecommerce/ITOL/index.htm>
- NOIE. (2000). *E-Commerce Beyond 2000*. Retrieved 26 September 2000, from [http://www.noie.gov.au/publications/NOIE/ecommerce\\_analysis/beyond2k\\_final.rtf](http://www.noie.gov.au/publications/NOIE/ecommerce_analysis/beyond2k_final.rtf)
- NOIE. (2002). *The Current State of Play. Australia's Scorecard*. Retrieved 26 June, 2002, from [http://www.noie.gov.au/Projects/information\\_economy/research&analysis/ie\\_stats/index.htm](http://www.noie.gov.au/Projects/information_economy/research&analysis/ie_stats/index.htm)
- OECD. (1998). *Small and Medium-Sized Enterprises and Electronic Commerce*. Retrieved 20 June, 2000, from <http://www.oecd.org/EN>
- Opticon Australia. (2001). *Western Region Telecommunications Capability Study*. Ballarat: State Government of Victoria. Department of State and Regional Development.
- Rogers, E. M. (1995). *Diffusion of Innovations* (4th ed.). New York: The Free Press.
- Rogers, E. M. (1997). Diffusion of New Media: New Directions. *Mass Comm Review*, 24(1 and 2), 75-81.
- Sensis. (2003). *2003 Yellow Pages Business Index E-Business Report. The Online Experience of Small and Medium Enterprises*. Retrieved 25 May, 2004, from <http://www.sensis.com.au/knowledge/research.php>
- Simpson, L. (2002). *Big Questions for Community Informatics Initiatives: A Social Capital Perspective*. Paper presented at the Community and Information Technology Conference: the Big Questions, Monash University, Melbourne, October 16.
- Skillsnet Association Cooperative. (2001). *E-Barriers, e-Benefits, e-Business. An investigation of Benefits and Inhibitors for Small and Medium Business Use of e-Commerce and Electronic Service Delivery*. Melbourne: McNicol Williams.
- The Allen Consulting Group. (2001). *Built for Business. Australia's Internet Economy* (A report commissioned by Cisco Systems). Sydney.

- The Allen Consulting Group. (2002). *Australia's Information Economy*. Canberra: National Office for the Information Economy.
- Van Beveren, J., & Thompson, H. (2002). The Use of Electronic Commerce by SMEs in Victoria, Australia. *Journal of Small Business Management*, 40(3), 250-253.
- Walczuch, R., Van Braven, G., & Lundgren, H. (2000). Internet Adoption Barriers for Small Firms in The Netherlands. *European Management Journal*, 18(5), 561-572.